



# ADVANCED AMPHIBIOUS ASSAULT VEHICLE

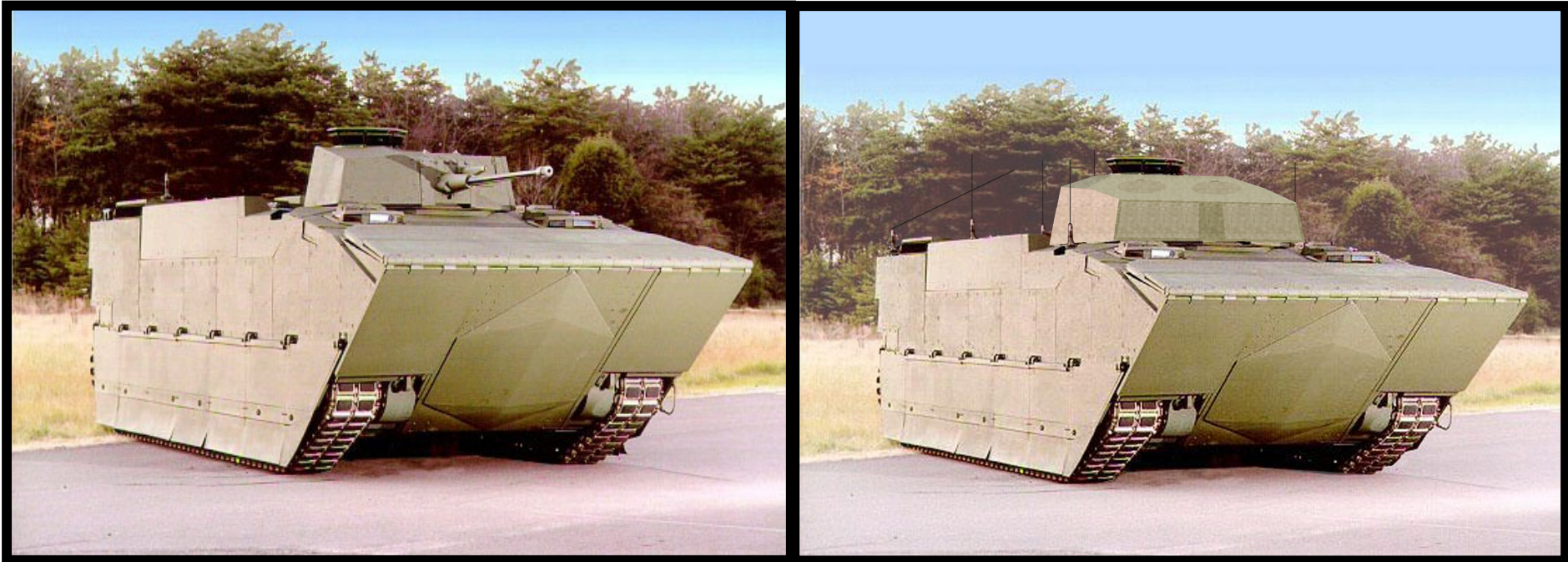


## AAAV Interoperability Working Group

### C4I Testing

Presented by Arlene Payne

9 MAY 2002





# IWG C4I Testing Purpose



- Describe the Test Process
- Provide User Jury and EOA History and Future Events
- Discuss the Test Schedule
- Describe the AAAV C4I System Architectures



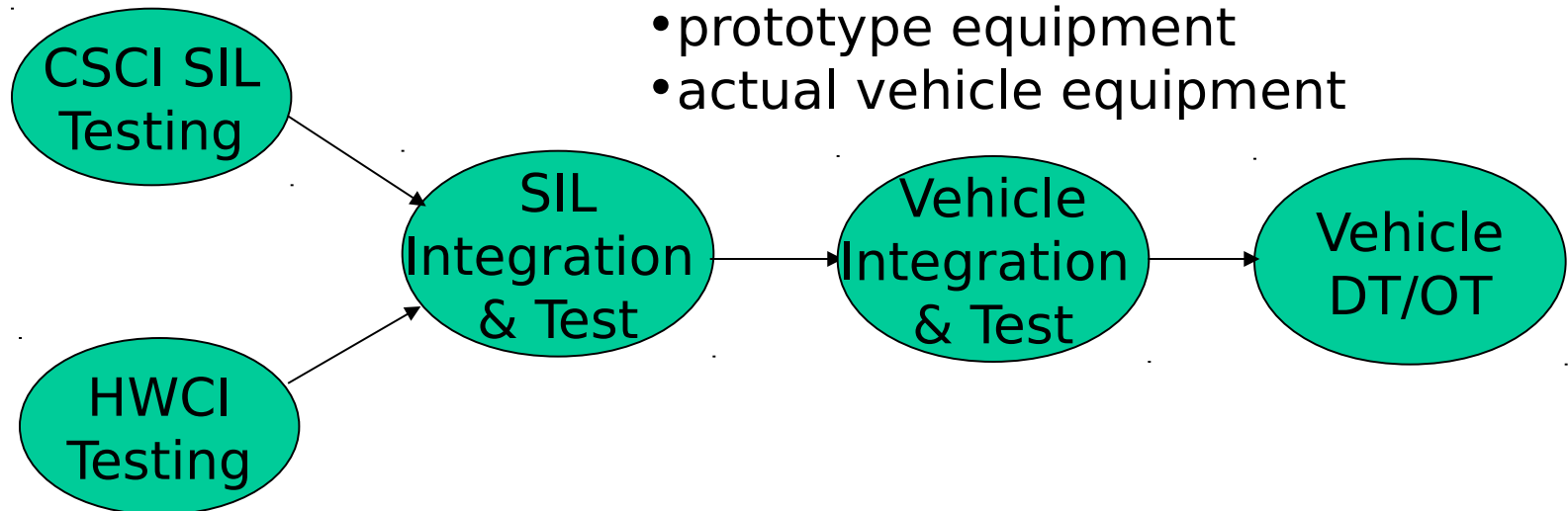
# IWG C4I Testing

## C4I Testing Process



SIL Equipment will be updated

- brass-boards
- commercial equipment
- prototype equipment
- actual vehicle equipment



@ subcontractor

CSCI = Computer Software Configuration Item

HWCI = Hardware Configuration Item

SIL = System Integration Laboratory

CSIL = AAAV(C) SIL

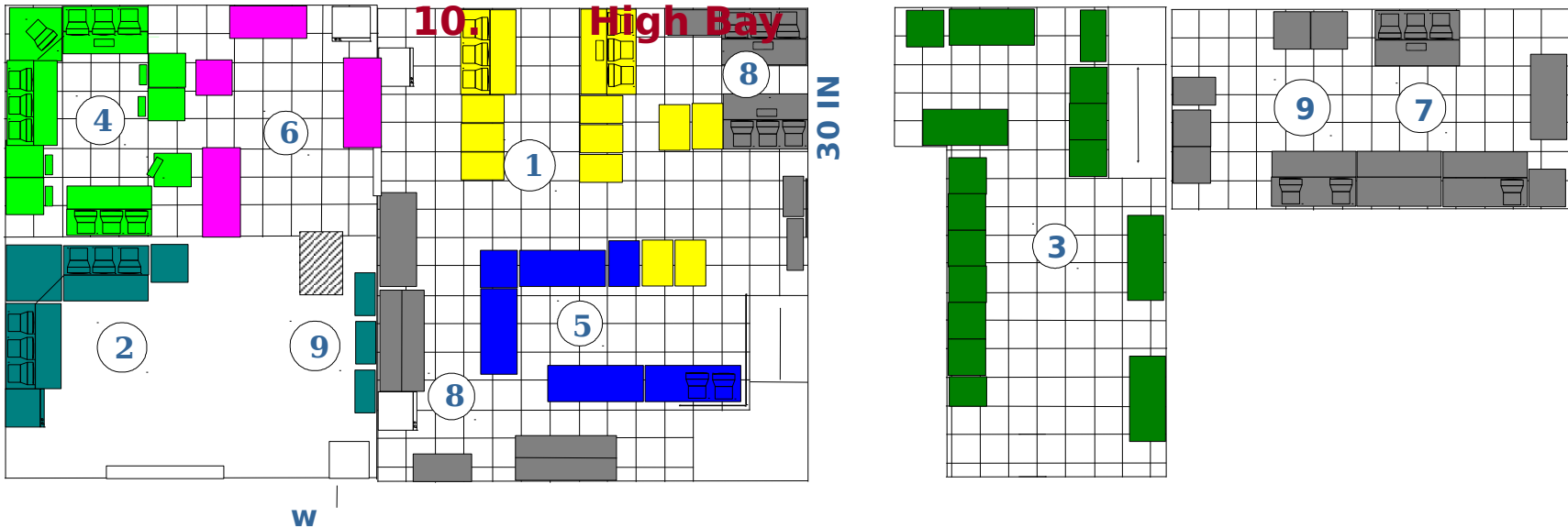
VSIL = Vehicle Electronics SIL



# IWG C4I Testing SIL Configuration



1. **SDD VSIL**
2. **MK-46 and Demonstrator  
Lab**
3. **CSIL**
4. **CSCI Lab**
5. **PDRR VSIL**
6. **Com / Nav**
7. **Harness Lab**
8. **Micro Min Repair**
9. **Technician Common Area**
10. **High Bay**

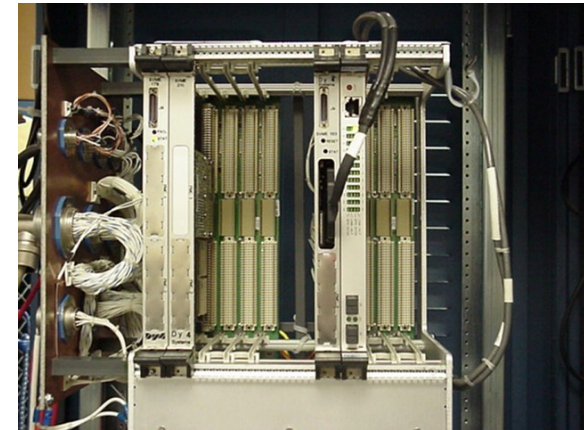
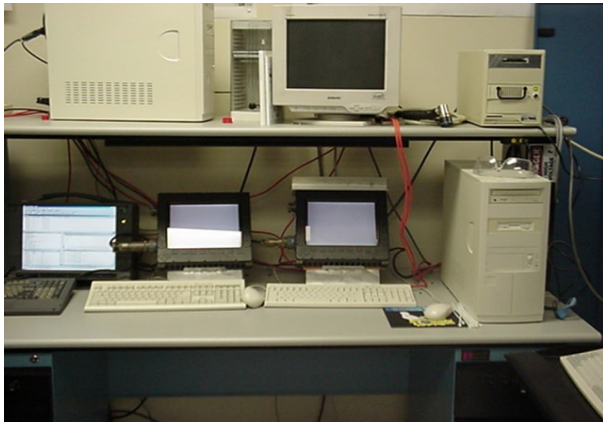




# IWG C4I Testing CSCI SIL



- CSCI bench allows testing of Vehicle electronics software prior to insertion in the vehicle.
- Vehicle subsystems are represented to allow testing of the software through a myriad of options







# IWG C4I Testing COM/NAV SIL



- Actual COM/NAV hardware represented to include the rack
- Interface with the Com/Nav equipment is provided
- Antennas are available for use





# IWG C4I Testing CSIL



- CSIL Status
  - CSIL currently housing workstations and radios
  - Actual Communications racks will be installed





# IWG C4I Testing Test Status



- Developing Detailed Test Schedules
  - CSCI Test Schedules
    - CSCI bench
    - Vehicle
  - HWCI Test Schedules
    - Contractor Name
    - HWCI CDR Date
    - Date Contractor HWCI Test Complete
    - Date Receive HWCI from Contractor
    - Date SIL Integration of HWCI Complete
    - Date SIL Testing of HWCI Complete
    - Date Vehicle Integration of HWCI Complete
    - Date Vehicle Testing of HWCI Complete





# IWG C4I Testing Test Status (continued)



- Developing Detailed Schedules
  - SDD AAAP(P) and AAAP(C) Test Schedules
    - Specification Validation
      - Test Events
      - Time for each
      - Rank Order
      - Number of Vehicles test on
      - Which Vehicles test on
    - DT-II
      - Test Events
      - Time for each
      - Rank Order
      - Number of Vehicles test on
      - Which Vehicles test on
  - Operational Mission Scenario/Mission Profile (OMS/MP) currently under revision
    - Results will effect testing



# IWG C4I Testing

## AAAV Communications Testing to Date



- AN/PSC-5C Multi-Band Multi-Mission Radio (MBMMR)
  - 20 November 2001 - Successful SATCOM voice test from P1 on the water at Pax River to local manpack and Tech Center manpack
  - 18 April 2002 - Successful SATCOM voice test using manpack radios
  - 23 April 2002 - Successful SATCOM voice test from P3 at Tech Center to local manpack
  - 8 May 2002 - Began Havequick mode testing with AN/PSC-5s
- Antenna and Co-site Testing
  - Fall 2001 - Antenna Testing and Characterization at Ft. HUAC
  - Fall 2001 - VHF Co-site Testing
- EPLRS Testing
  - Fall 2001 - CMOP2 - Successfully tested C2PC over an EPLRS network.



# IWG C4I Testing

## AAAV(C) Initial Draft Test Events to EOA



- Aberdeen
  - Basic communications between vehicles
- Pax
  - Basic communications between vehicles
- AVTB
  - Basic communications between vehicles
  - C4I Comm Evaluation - Surf Transit
  - C4I Comm Evaluation - Land Mobile
  - Extended Range Comm with System Integration Environment (SIE), MCTSSA
  - Extended Range Comm with Air (Rotor and Fixed Wing)
  - C4I Comm with Ship
  - C4I Comm with LCAC
  - Shipboard Operations
  - Well Deck Operations
  - Stationary Operations



# IWG C4I Testing

## AAAV(P) & (C) USER JURIES & EOAs



- **User Jury I** - AAAV(P) GDAMS Existing Technology Demonstration: Oct 28-29, 1996
- **User Jury II** - AAAV(P) Crew Station Mapping and Navigation Displays, Interactive Electronic Technical Manual (IETM), and Programmable Pushbutton Switches Demonstration/Evaluation: Apr 16-18, 1997
- **User Jury III** - AAAV(P) Marine-Machine Interface (MMI): Oct 22-24, 1997
- **User Jury IV** - AAAV(P) Troop Arrangements and Egress: May 18-22, 1998
- **User Jury V** - First AAAV(C): Staff Configuration: May 25, 1999 and June 1, 1999
- **User Jury VI** - Second AAAV(C): Marine-Machine Interface (MMI): Feb 2, 2000
- **User Jury VII** - Third AAAV(C): Seating Arrangements and Egress: Aug 29-30, 2000
- **User Jury VIII** - Fourth AAAV(C) Mobile Operational Prototype I: Sep 19-21, 2000
- **User Jury IX** - Fifth AAAV(C): Staff Interaction and Workstation MMI: Apr 23-26, 2001
- **EOA** - AAAV(C) Mockup: Jul 2001
- **User Jury X** - Sixth AAAV(C): MMI, Egress and Seating: Aug 23-26, 2001
- **User Jury XI** - Seventh AAAV(C): Mobile Operational Prototype II: Aug 21-24, 2001
- **EOA** - Training for Land Mobility: Aug/Sep 2001
- **EOA** - Land Mobility: Oct 2001
- **User Jury XII** - Eighth AAAV(C): Weapon Station & Live Fire Shoot: Jan 23-24, 2002

**User Juries and EOAs Provide Early and Invaluable  
Insight into AAAV Design**



# IWG C4I Testing

## FUTURE AAV(P) & (C) USER JURIES & OAs



- **EOA** - AAV(P) Amphibious: Oct/Nov 2002
- **User Jury XIII** - Ninth AAV(C): Seat Evaluation: Jul 2002
- **User Jury XIV** - AAV(P) & (C): VAPS Display MMI: Aug 2002
- **User Jury XV** - Tenth AAV(C): Target C4I Networks: Apr 2003
- **User Jury XVI** - AAV(P): Pre-OA Verification: Oct 2003
- **OA** - AAV(P) & (C) SDD: Spring 2004
- **OA** - AAV(P) Cold Weather: Winter 2005
- **User Jury XVII** - Eleventh AAV(C): Post OA System Modification Verification: Jun 2005
- **User Jury XVIII** - AAV(P): Post OA System Modification Verification: Oct 2005
- **User Jury XXIV** - Twelfth AAV(C): Pre IOT&E System Verification: Mar 2006

**User Juries and OA's Provide Early and Invaluable  
Insight into AAV Design**



# TEMP

**Table II-1. Integrated Program Schedule**[illegible]

<sup>1</sup> MCOTEA's Independent Assessment & Evaluation Reports

## <sup>2</sup> PDRR prototype vehicle PDR and CDR

<sup>3</sup> AAV(C) C4I Suite DT-I testing is a system level test of the Command & Control Suite and includes JITC Interoperability Testing

<sup>4</sup> AAV(C) DT-II testing utilizes a complete AAV(C) SDD prototype and includes further JITC Interoperability Testing

<sup>5</sup> Live Fire PDRR and SDD Tests include Component Ballistic, Armor Validation & Characterization, Controlled Damage, AAV(C) Controlled Damage, and Characterization Testing

**DRAFT**



# IWG C4I Testing AAAV Design Strategy

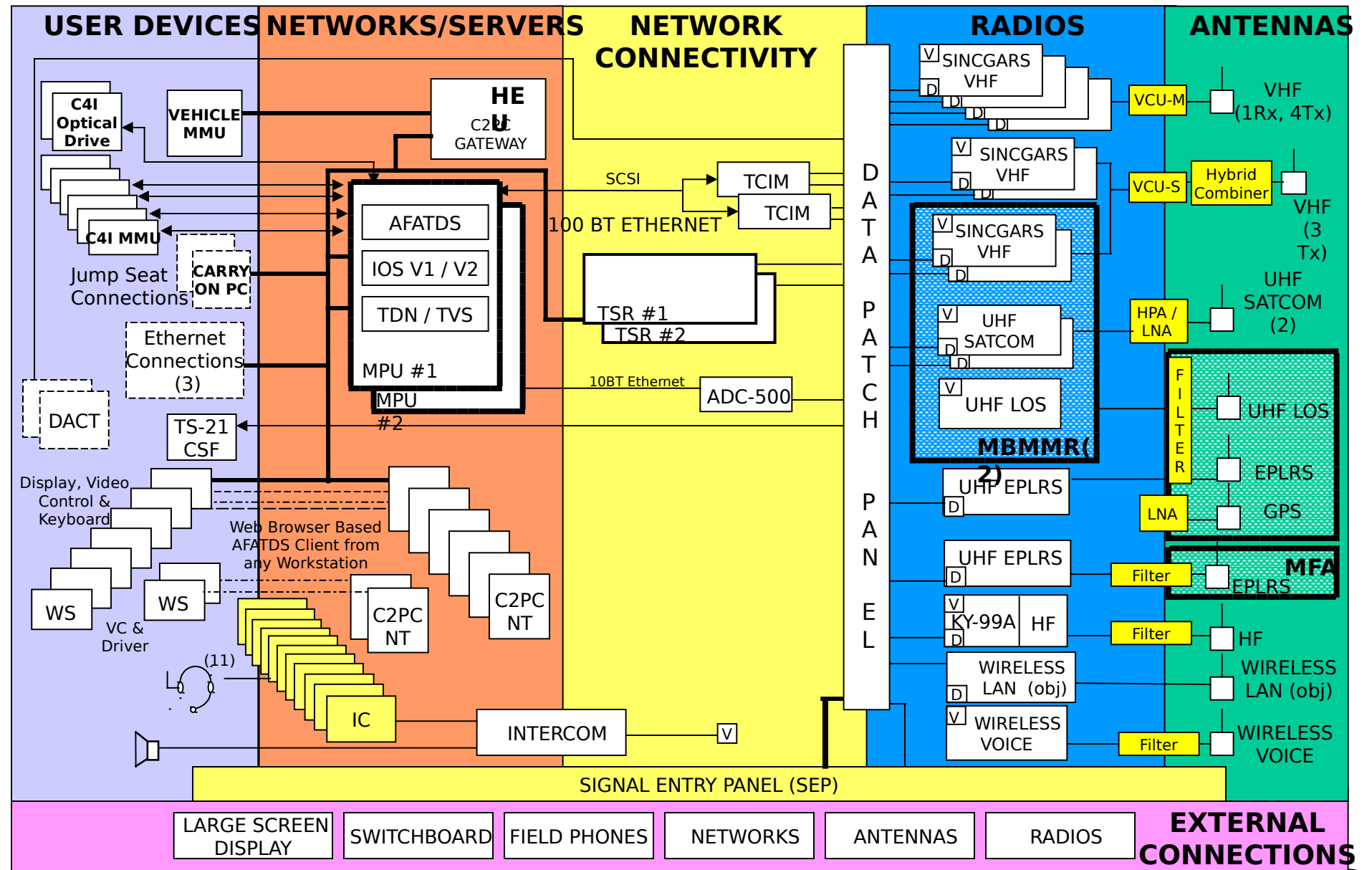


- Plan to leverage off fielded equipment
  - Host fielded C4I hardware and software to enhance our interoperability posture
- Future Changes/modifications to SW, HW, and/or C4I Architecture require close coordination between USMC organizations and other services
  - A two-way dialogue is needed at all organizational levels and working groups
  - Common SW/HW approaches, based upon an open systems architecture approach, are needed to meet constrained funding and rapid technology insertion



# IWG C4I Testing

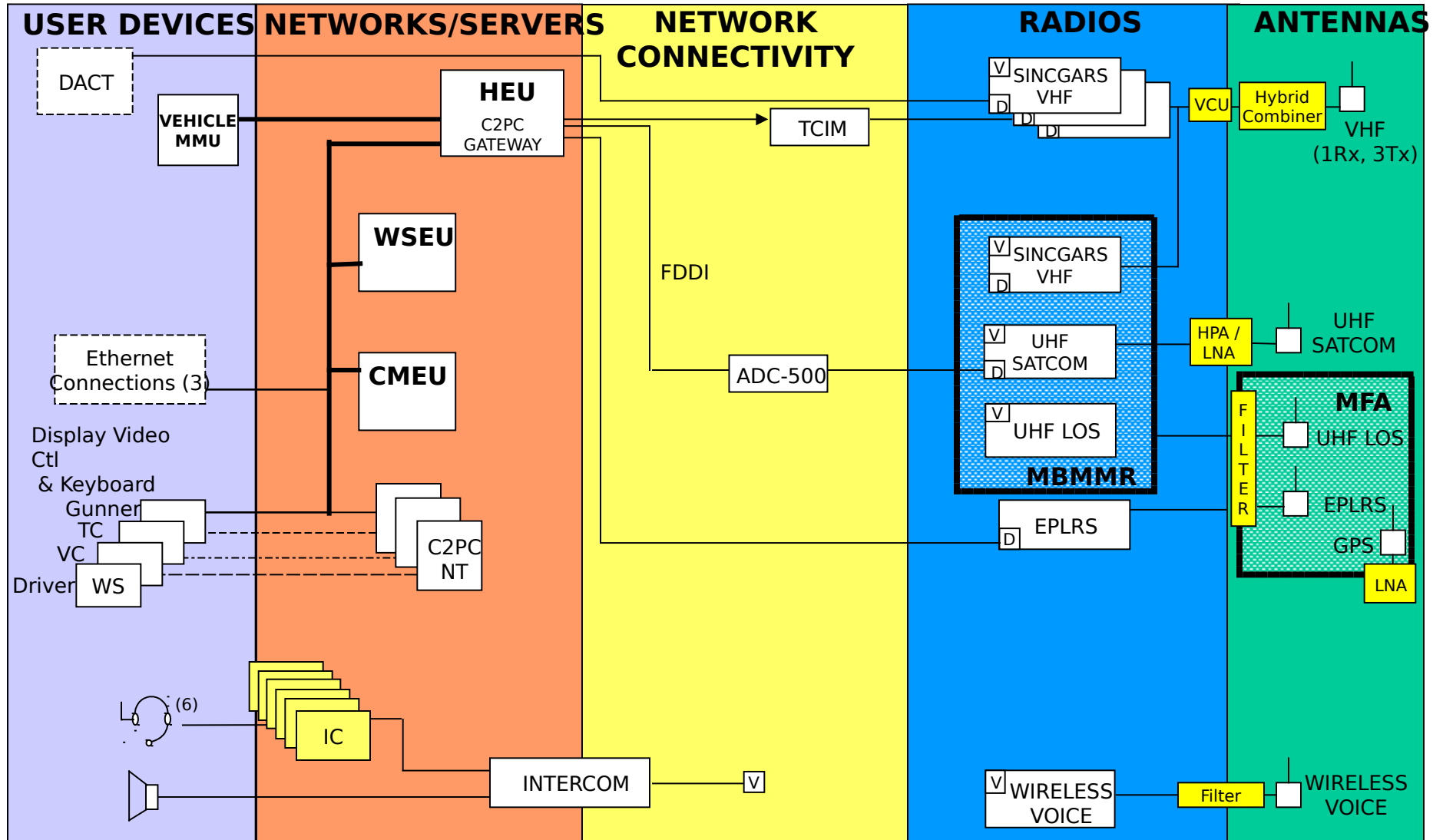
## AAAV(C) C4I SYSTEM ARCHITECTURE





# IWG C4I Testing

## AAAV(P) C4I SYSTEM ARCHITECTURE





# IWG C4I Testing Acronym List



HEU = Hull Electronics Unit

MMU = Mass Memory Unit

CSF = Copier, Scanner, Fax

MPU = Multi-Processor Unit

IC = Intercom (Interface units at the operator positions)

MFA = Multi-Function Antenna

HPA/LNA = High Power Amplifier/Low Noise Amplifier

LNA = Low Noise Amplifier

VCU-M = VHF Cosite Unit - Master

VCU-S = VHF Cosite Unit - Slave

JTRS = Joint Tactical Radio System

WLAN = Wireless Local Area Network





# IWG C4I Testing Test Issues



- Combined DT/OT
- JTRS Integration
- Combat Identification (CID) Integration
- WLAN Plan forward
  - Part of JTRS (Wideband Network Waveform (WNW))
- Operational Mission Scenario/Mission Profile (OMS/MP) currently under revision



# QUESTIONS

